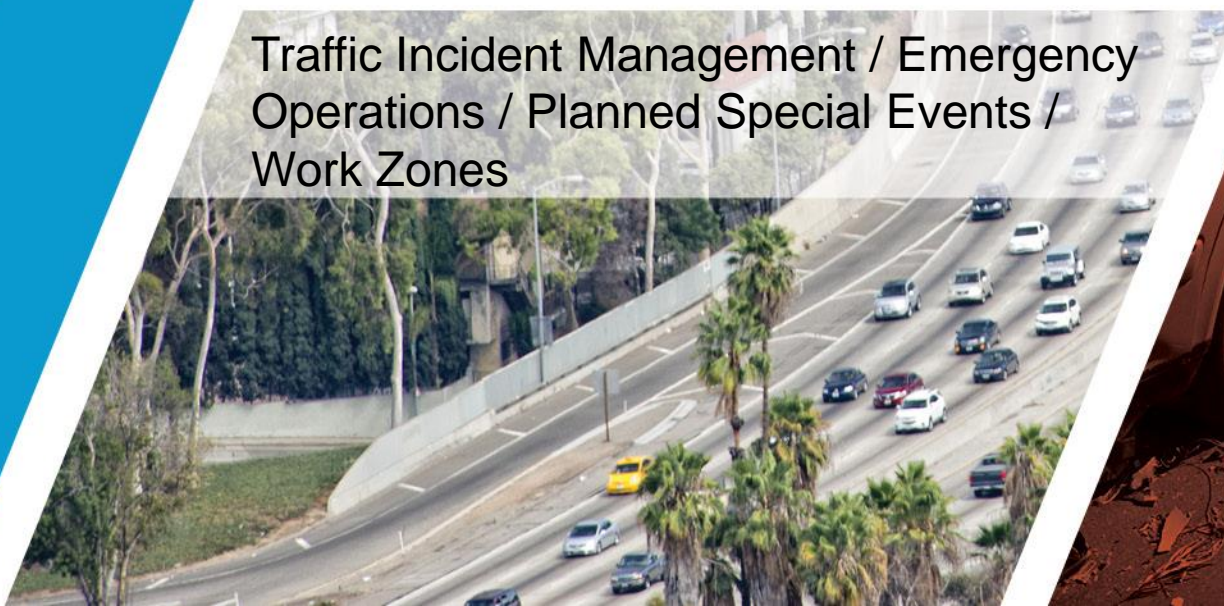




CALTRANS SUBREGIONAL OPERATIONS FORUMS

Traffic Incident Management / Emergency
Operations / Planned Special Events /
Work Zones





Session Focus

► Managing “events”

- ↳ Conditions that are outside “normal” or ideal
- ↳ Disruptions to the system

► Two basic categories of events – planned and unplanned

Planned	Unplanned
<ul style="list-style-type: none"> - Special events - Work zones (most) 	<ul style="list-style-type: none"> - Traffic incidents - Emergency situations - Weather events



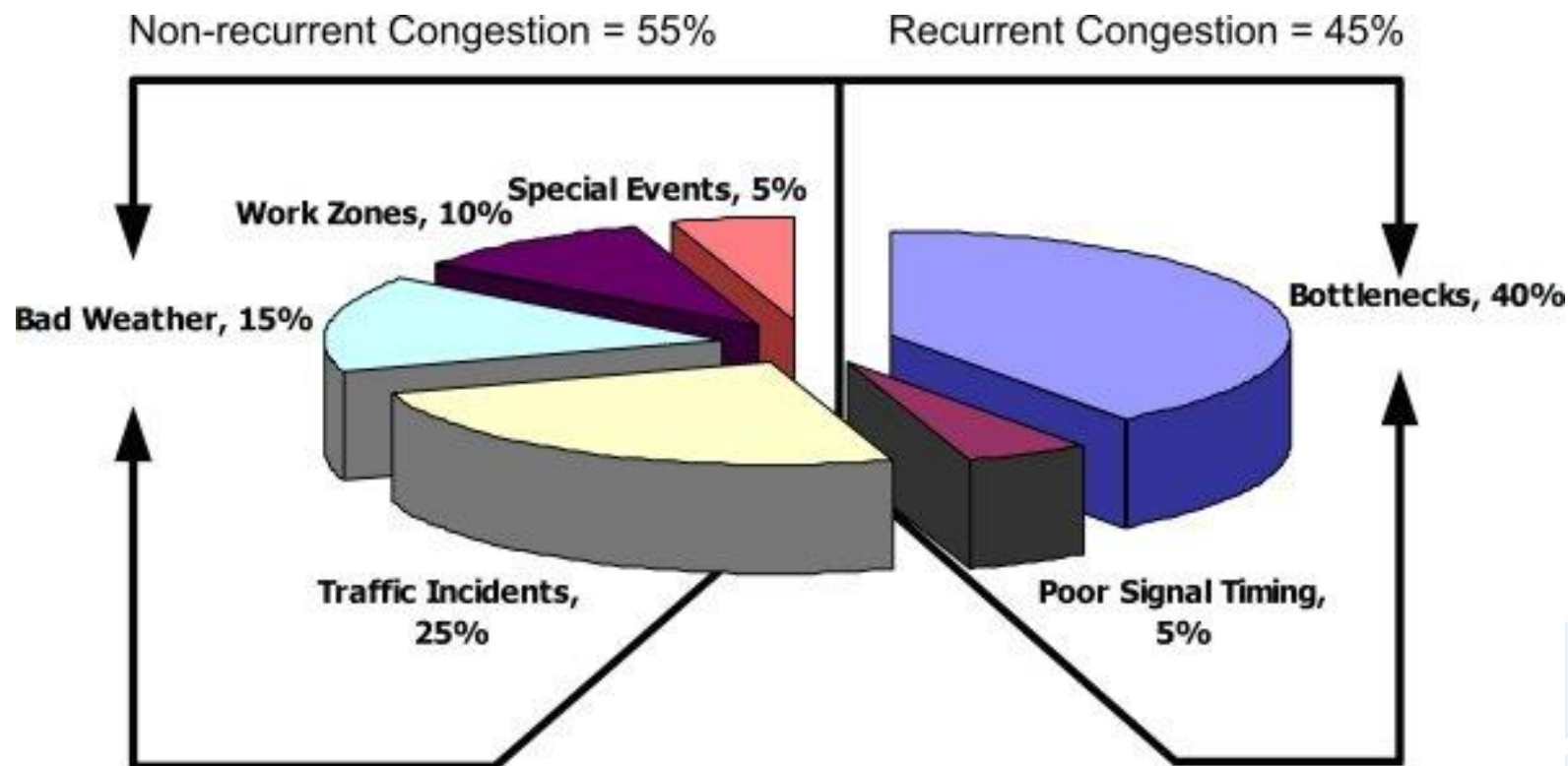
Effects of Events

- ▶ Events cause non-recurring congestion
- ▶ Create conditions that are:
 - ↳ Changing over time
 - ↳ Less predictable
 - ↳ Unexpected to system users
- ▶ Infrastructure investments help but are not full solutions





Effects of Events



Managing Non-Recurring Congestion and TSMO

Managing and preparing for these events is an operational philosophy that supports and becomes a foundation for transportation system management and operations (TSMO).





Traffic Incident Management



Traffic Incident Management (TIM)

- ▶ Planned, coordinated, multidisciplinary process
 - ▶ Detect, respond to, and clear traffic incidents
 - ▶ Restore traffic flow as safely and quickly as possible
- Reduce duration and impacts of traffic incidents
 - Improve the safety of motorists, crash victims, and responders





National TIM Program Vision...

Enhanced planning and training of all TIM personnel:

1. Reduce or eliminate responder and motorist injuries and fatalities
2. Promote rapid incident clearance, thereby reducing traffic congestion and vulnerability
3. Develop or enhance local TIM Programs that ultimately benefit corridors, regions, and states
4. Measure performance that demonstrates improved TIM responses and programs over time
5. Emphasize TIM as a system operations “core mission” for all responders

The Evolving Business Case: Why TIM?

1. Safety

- ↳ Victims
- ↳ Responders
- ↳ Travelers





The Evolving Business Case: Why TIM?

2. Cost

	Cost of Crashes		Cost of Congestion	
	Total	Average Per Person	Total	Average Per Person
2005 National	\$164.2 billion	\$1,051	\$57 billion	\$430
2009 National	\$299.5 billion	\$1,522	\$97.7 billion	\$590

Source: AAA Crashes vs. Congestion, What's the Cost to Society? - Nov. 2011

Why TIM?

In California, since 2010, 27 responders have been killed in the line-of-duty while responding to incidents on California's highways:

Law Enforcement - 9 Officers Killed

Ken Collier, San Diego Sheriff – Feb 28, 2010
 Phillip Ortiz, CHP – June 22, 2010
 Justin McGrory, CHP – June 27, 2010
 Brett Oswald, CHP – June 27, 2010
 Ryan Bonaminio, Riverside PD – Nov 7, 2010
 Brian Law, CHP – Feb 17, 2014
 Juan Gonzalez, CHP – Feb 17, 2014
 Kostiuhenko, Ventura Sheriff – Oct 28, 2014
 Nathan Taylor – March 13, 2016

Fire Personnel - 2 Responders Killed

David Ratledge – Feb 29, 2012
 Christopher Douglas – Jul 5, 2013

EMS – 2 EMS Personnel Killed

Esteban Bahena – April 1, 2010
 Douglas Odgers – May 8, 2011

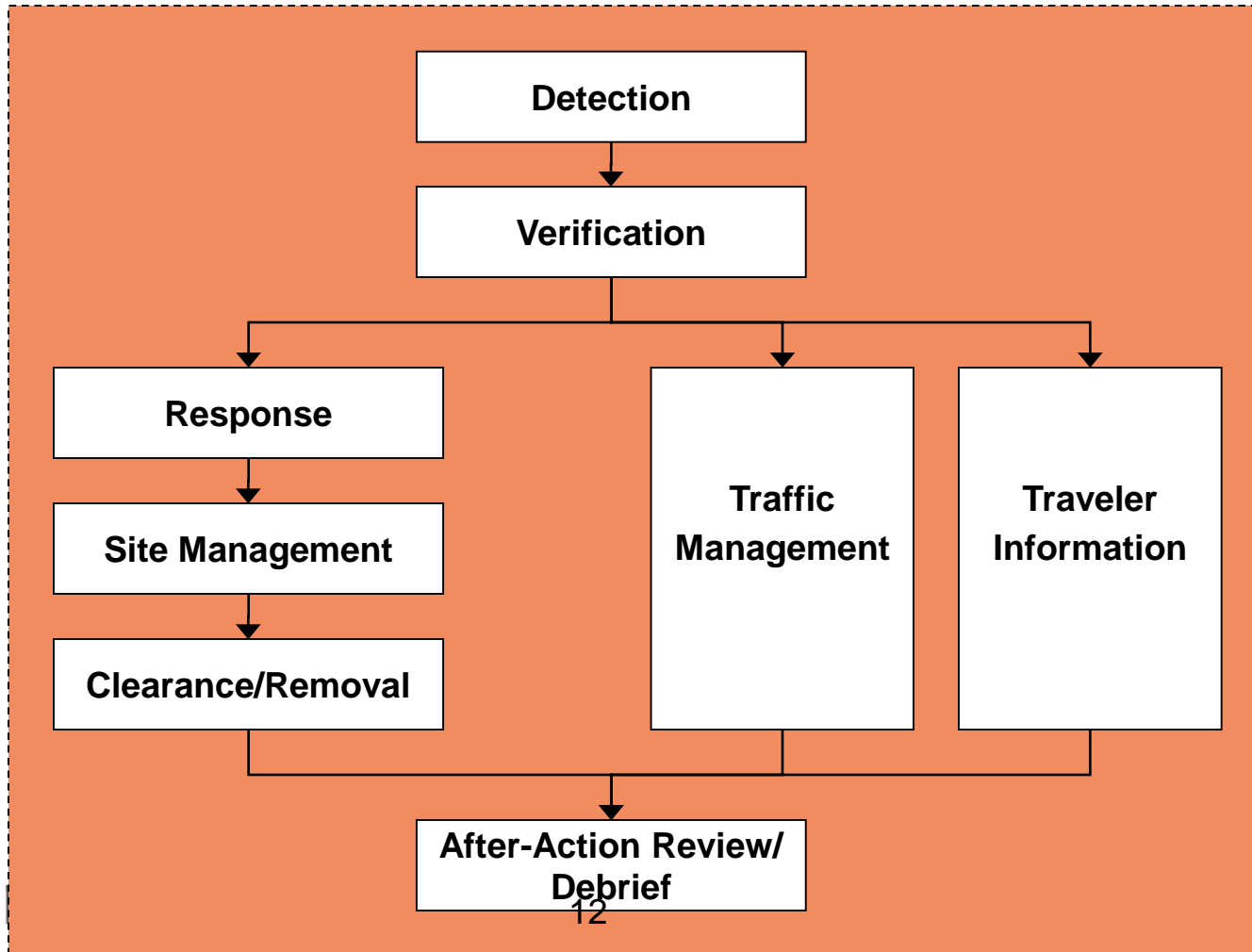
Towing - 10 Tow Operators Killed

Michael Sanders – Feb 7, 2011
 Christopher Tatro – Dec 17, 2011
 David Robinson – Mar 20, 2012
 Jesus Salcedo – Mar 30, 2012
 Shaun Riddle – Dec 8, 2012
 Faapuna Manu - Dec 8, 2012
 Ronald Carver – Feb 11, 2013
 Christopher Gladden – July 28, 2013
 Ricardo Valdez – January 28, 2014
 Jabar Issa – January 17, 2015

Caltrans Maintenance – 4 Workers Killed

Gary Smith – Nov 7, 2010
 Stephen Palmer – May 4, 2011
 Jaime Obeso – June 7, 2011
 Richard Gonzalez – June 20, 2011

TIM Process

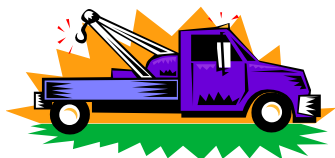


National Unified Goal for TIM

The NUG for TIM is:



Responder Safety

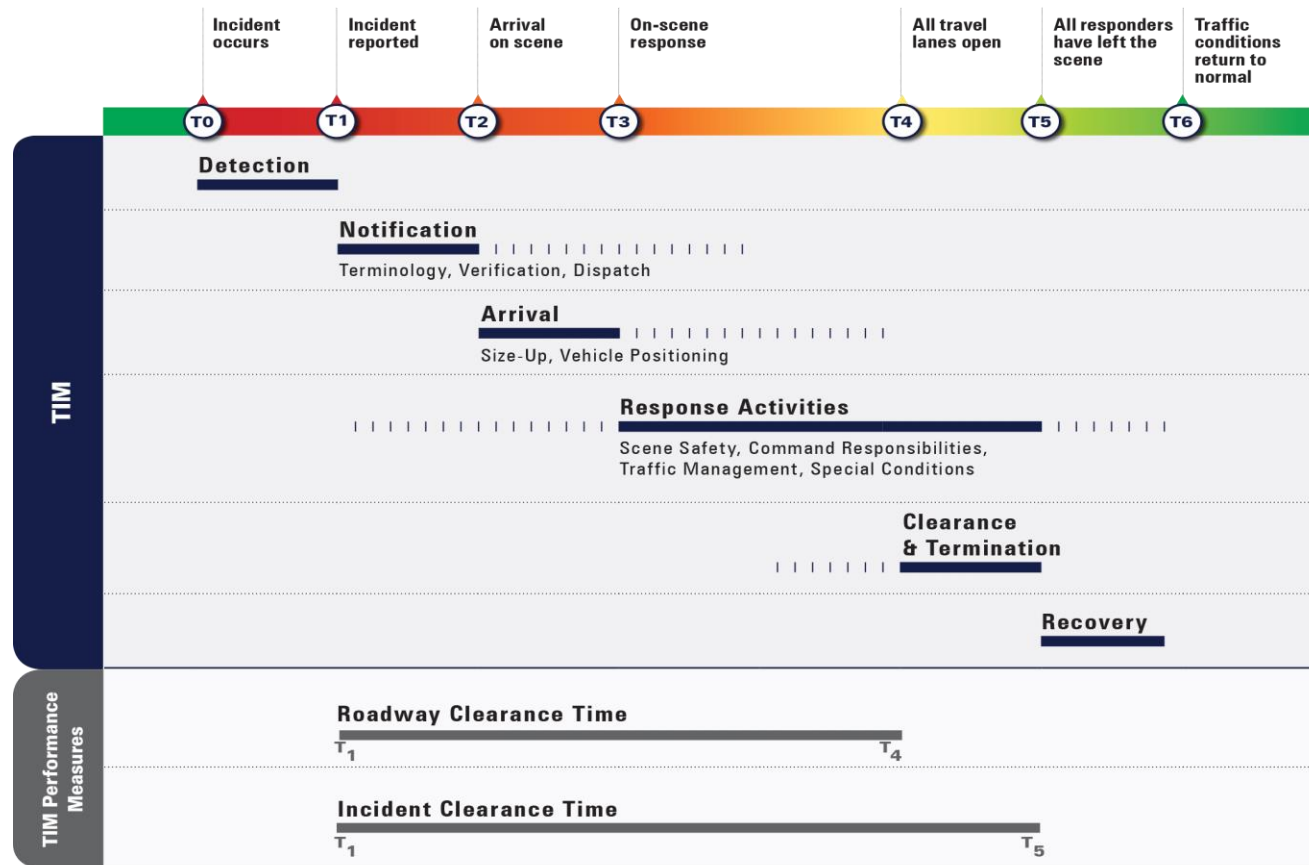


Safe, Quick Clearance



Prompt, Reliable, Interoperable
Communications

Incident Timeline: What Does Safe Quick Clearance Mean?





What is a TIM Program?

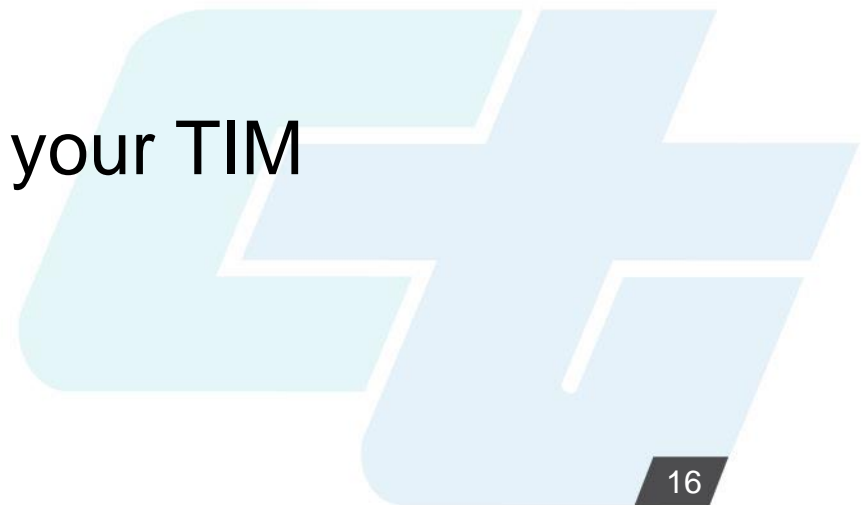
- ▶ The goal of a TIM program is to work towards a more effective, efficient response for all responding agencies
- ▶ Conscious effort to coordinate and plan to create an effective, comprehensive TIM program
- ▶ TIM programs and associated committees and task forces are sustained and ongoing





Discussion Item

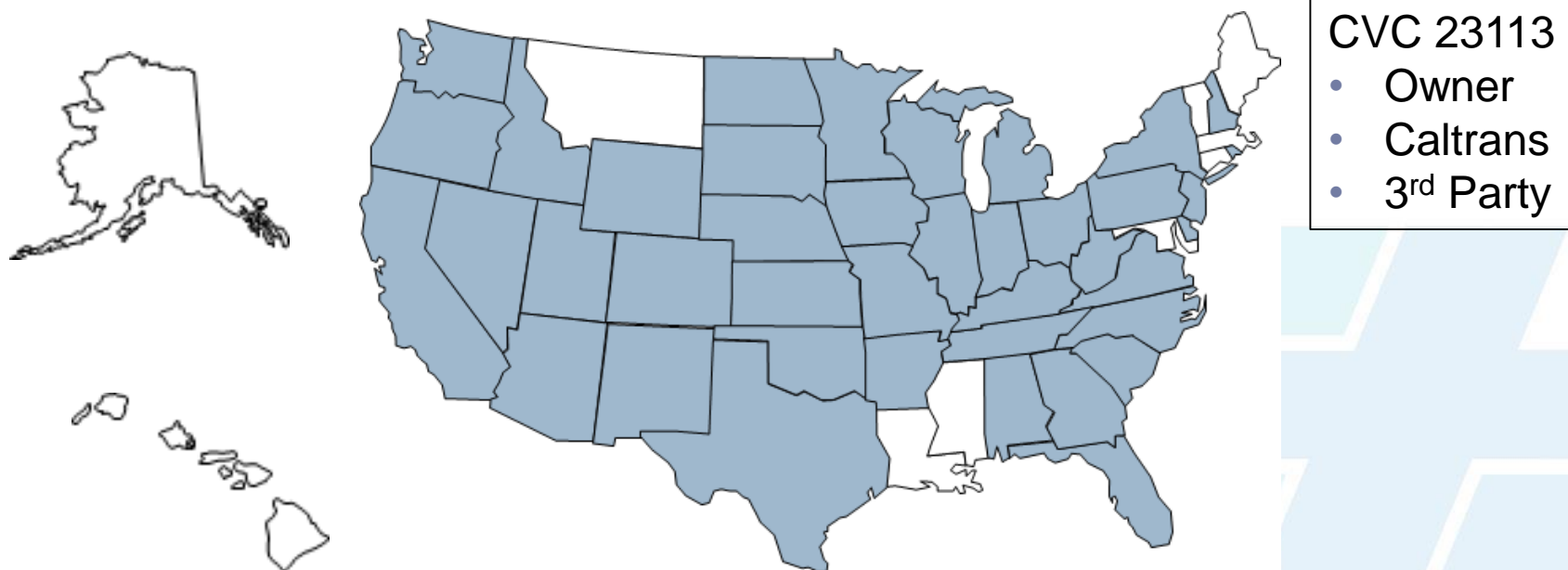
- ▶ What are your current activities and program for TIM?
- ▶ Who if any are identified as dedicated TIM staff?
- ▶ What has been a significant challenge to your program? How are you addressing that challenge?
- ▶ Who should be included in your TIM discussions?





Authority Removal or “Remove It” Law

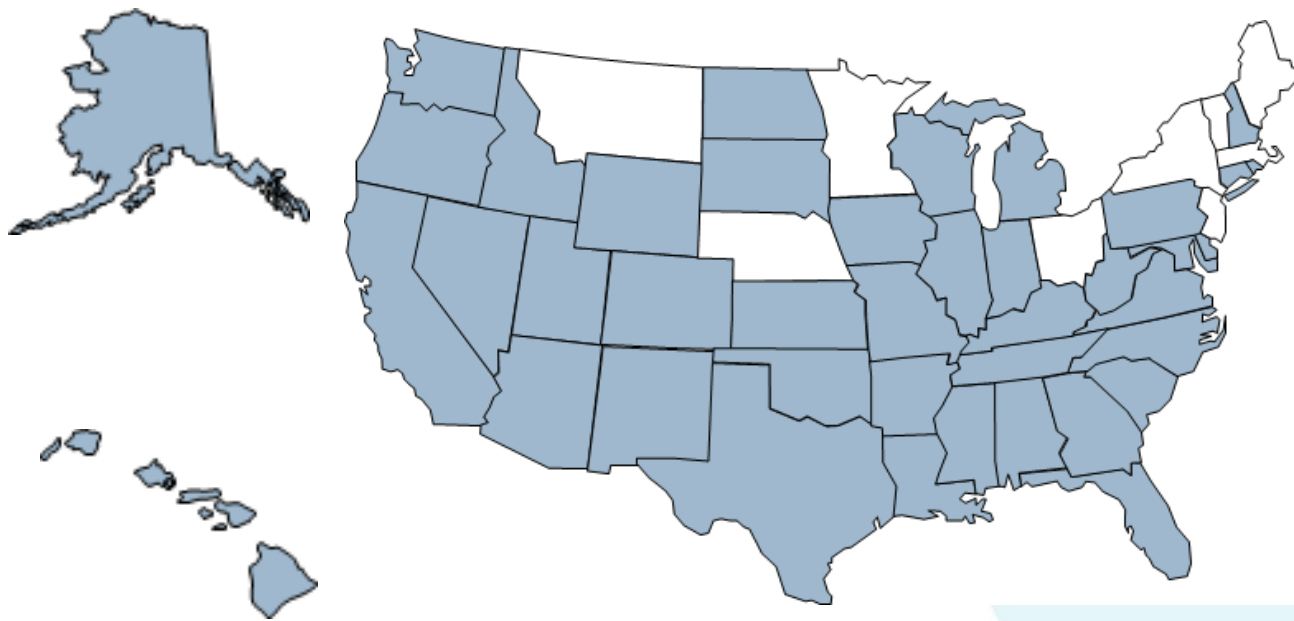
- ▶ Remove abandoned vehicles and spilled cargo from the roadway
- ▶ Authority and immunity from liability for CHP and anyone they direct





Driver Removal or “Move It” Law

- ▶ Minor, non-injury crash
- ▶ Vehicles are drivable
- ▶ Required to move vehicles from travel lanes



CVC 20002

- Misdemeanor
- 6 mo. County jail
- \$1000 fine



SR61(CA)



Towing – CVC 21719

- ▶ Tow operators can use the center median or right shoulder
 - ↳ A peace officer determines the obstruction is causing unnecessary delay.
 - ↳ A peace officer gives permission to the tow truck driver.
 - ↳ The tow truck is operated at a prudent speed with due regard for weather, visibility, and traffic.
 - ↳ The tow truck displays flashing amber warning lamps to the front, rear, and both sides.

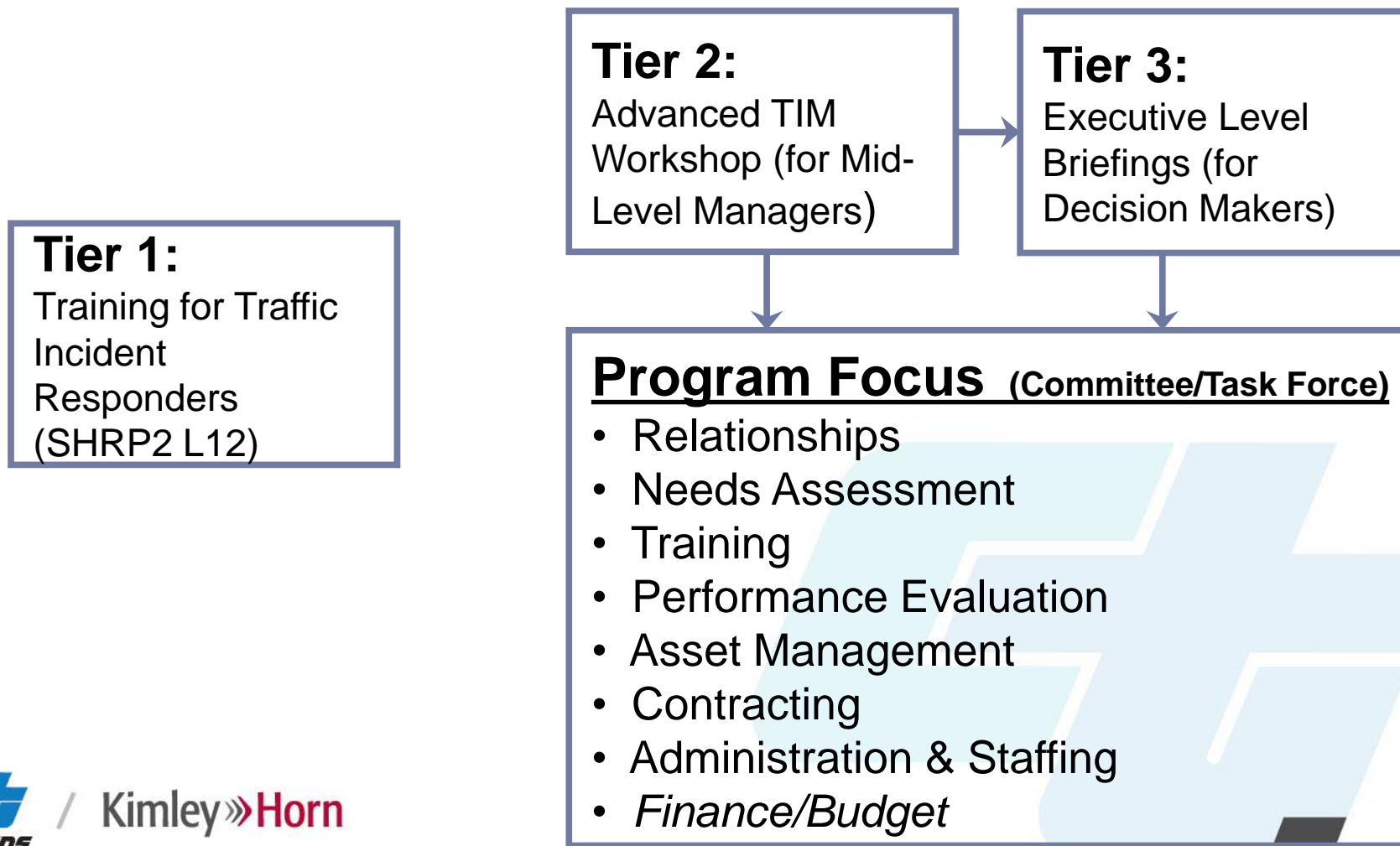


Freeway Service Patrol

- ▶ Trained personnel using specially equipped vehicles to:
 - ↳ patrol congested highways,
 - ↳ search for and respond to traffic incidents, and
 - ↳ provide motorist assistance
- ▶ Benefit-to-Cost Ratio (Davies 2016)
 - ↳ Sac/Yolo 7:1
- ▶ WAZE may be a tool to speed dispatch/response



High-Level TIM Training Framework and Tiered TIM Focus Areas



Traffic Incident Management Training

- ▶ Multi-disciplinary training with national curriculum
- ▶ Develops cadre of emergency responders who work together at an accident scene in a coordinated manner
- ▶ Improves safety to responders and travelers
- ▶ Developed by responders for responders



CA SHRP2 TIM Training

- ▶ 14 1.5-day “Train-the-Trainer” courses
- ▶ 795 4-hour responder courses
- ▶ 16,452 total responders trained in CA
 - ↳ 460 instructors trained
 - ↳ 12,745 responders trained in classes
 - ↳ 3,150 responders trained online
 - ↳ 97 responders trained with CT video
- ▶ Institutionalized:
 - ↳ CHP Academy
 - ↳ Caltrans Maintenance Academy (NEMO)
 - ↳ Towing rotation/FSP
 - ↳ EMSA CEUs
 - ↳ LEMSA contract requirement

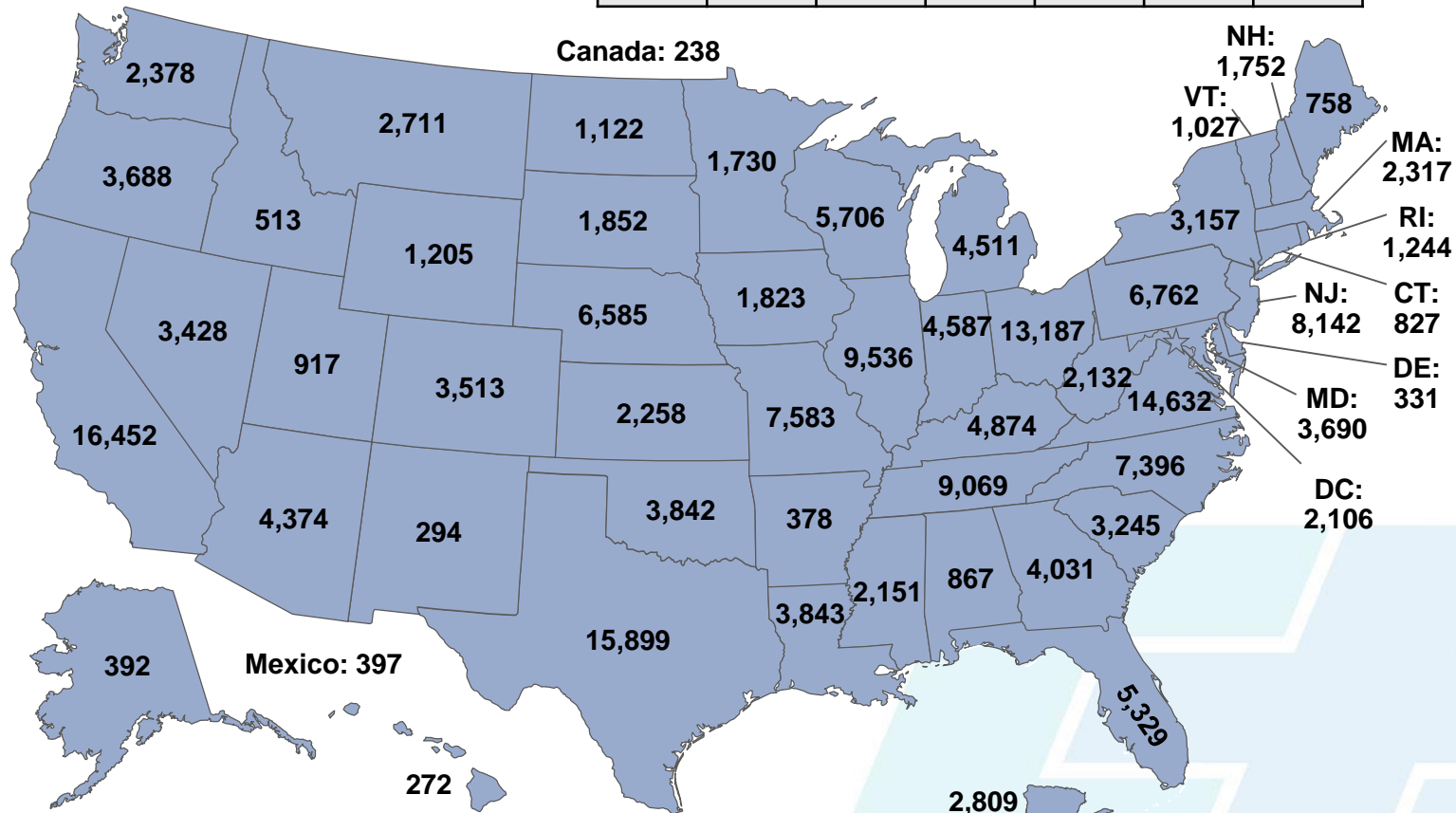


TIM Training Program Implementation Progress

Total Trained = 173,284 as of April 4, 2016

Sacramento Region: 125 classes:

Law	Fire	Tow	EMS	DOT	Other	Total
788	187	579	32	572	38	2196



213,696 Responders Trained Nationally (7.6% from California)

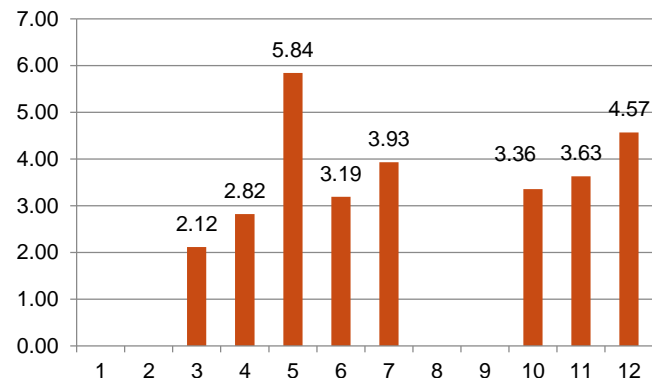


Measuring Success

► What Gets Measured Gets Performed...

- ↳ Quantifying TIM benefits will advance program continuity.
- ↳ Every Day Counts 4 (EDC-4 Initiative):
 - “Accelerating Traffic Incident Management Data Collection”
 - ↳ Increase the volume of data from transportation, law enforcement, and other responder agencies.
 - ↳ Promotes use of low-cost, off-the-shelf technologies that streamline data collection.

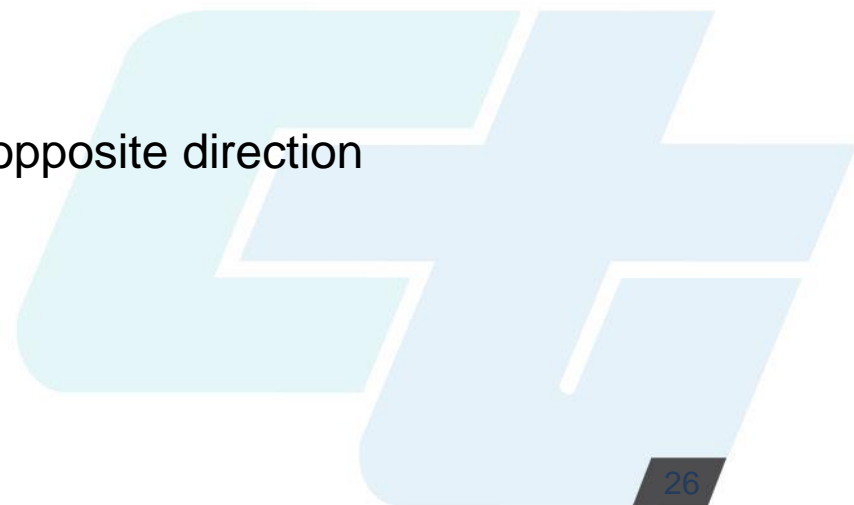
Average Clearance Per District (hr)





TIM Performance Measures

- ▶ “Roadway” Clearance Time
 - ↳ Time from first record of an incident by a responsible agency to all lanes being open to traffic - **MIDB**
- ▶ “Incident” Clearance Time
 - ↳ Time from first record to time last responder leaves scene
- ▶ Secondary Crashes
 - ↳ Crashes beginning with the time of detection of the primary incident
 - ↳ within the incident scene or
 - ↳ within the queue, including the opposite direction





Discussion: Improving Traffic Incident Management

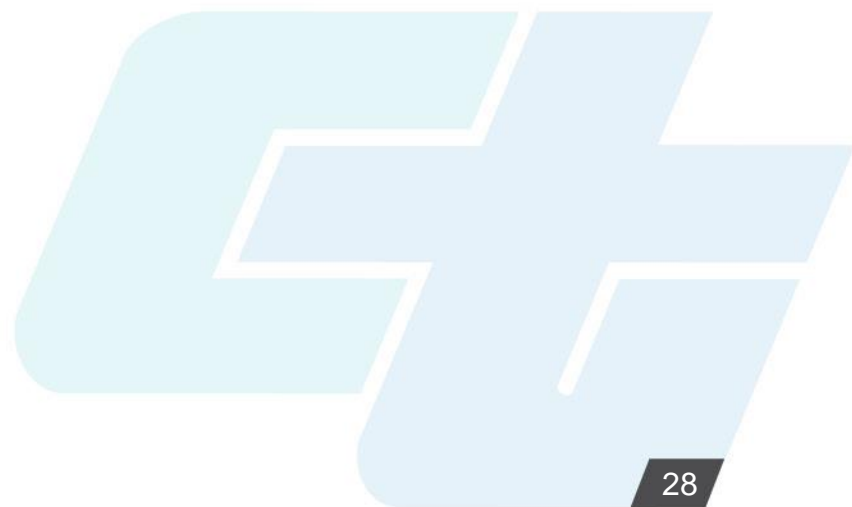
- ▶ How to move to the next level?
 - ↳ Meet! Know your counterparts!
- ▶ How to involve key stakeholders?
 - ↳ Show that you can provide a service
- ▶ How to sell the program internally?
 - ↳ Data, data, data!





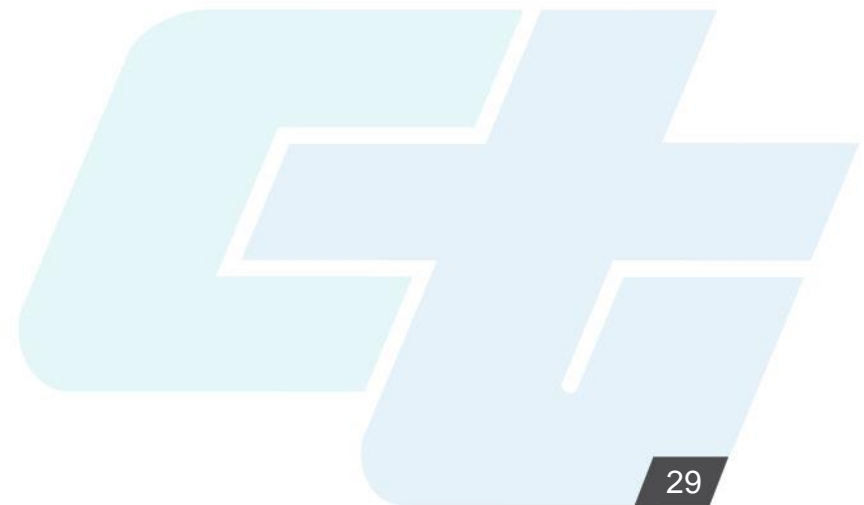
TIM Take Aways

- ▶ Develop a TIM “program”
- ▶ Include all of the critical stakeholders in TIM activities
- ▶ Know the NUG and the NUG framework
- ▶ Take advantage of the TIM training
 - ↳ Provide time for your instructors to train and for your personnel to attend training
 - ↳ Video
 - ↳ Online





Emergency Operations



Types of Emergency Events

- ▶ Tsunamis/Tornadoes
- ▶ Floods
- ▶ Heavy rains
- ▶ Earthquakes
- ▶ Wild Fires
- ▶ Winter Weather / Snow and Ice Storms
- ▶ Homeland Security / Catastrophic Infrastructure emergencies



Common Characteristics of These Events

- ▶ Large scale impact
- ▶ Can happen anytime, often without warning
- ▶ Transportation is critical to effective response
 - ↳ Whether transportation infrastructure is affected or not



Emergency Operations Goals

- ▶ Minimize the impact of disaster on people, property, environment, and the economy.
- ▶ Assure mobility of the public and emergency response personnel.
- ▶ Assure agency continuity.
- ▶ Protect agency facilities and resources.



Emergency Operations Practice Areas

- ▶ Interagency Coordination and Communication
- ▶ Policy/MOUs
- ▶ Emergency Response Planning/Training
- ▶ Threats and Vulnerabilities
- ▶ Emergency Operations
- ▶ Equipment
- ▶ Mutual Aid
- ▶ Notification, Awareness, and Information Sharing



We will discuss each of these in the following slides

Interagency Coordination and Communication

- ▶ Coordination and communication is key during the emergency
 - ↳ Public information coordination needs to be included
- ▶ Communications interoperability
 - ↳ Interagency communications are critical
 - ↳ Options include common radio frequencies and mobile phones
- ▶ Interagency training is important to coordination and communication





Policy/MOUs

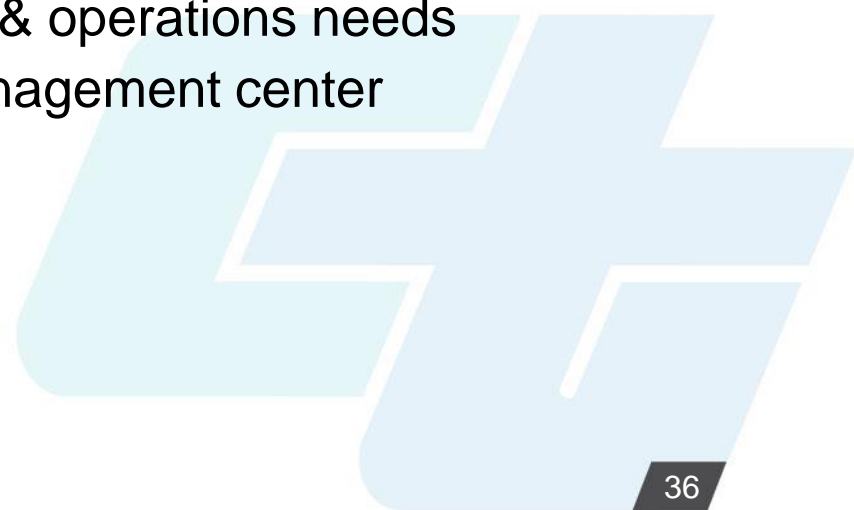
- ▶ Protection of vulnerable systems/components
- ▶ Critical infrastructure protection
- ▶ Cooperation between enforcement and transportation agencies for closing roadways
 - ↳ CHP/CT Joint Operational Policy Statements
 - ↳ Streets and Highways Code 92 – Caltrans owns infrastructure - any act necessary
 - ↳ CA Vehicle Code 2400 – CHP has primary investigative authority – Incident Commander
 - ↳ Natural link to TIM





Emergency Operations Planning

- ▶ Define needs by type of emergency event
 - ↳ Consider each practice area mentioned earlier
- ▶ Define stakeholders, partners, and resources
- ▶ Develop Concept of Operations for emergency response
 - ↳ Emergency operations center
 - ↳ Roles and responsibilities
 - ↳ Staffing - especially maintenance & operations needs
 - ↳ Relationship of transportation management center





Make Sure Your Plan Includes

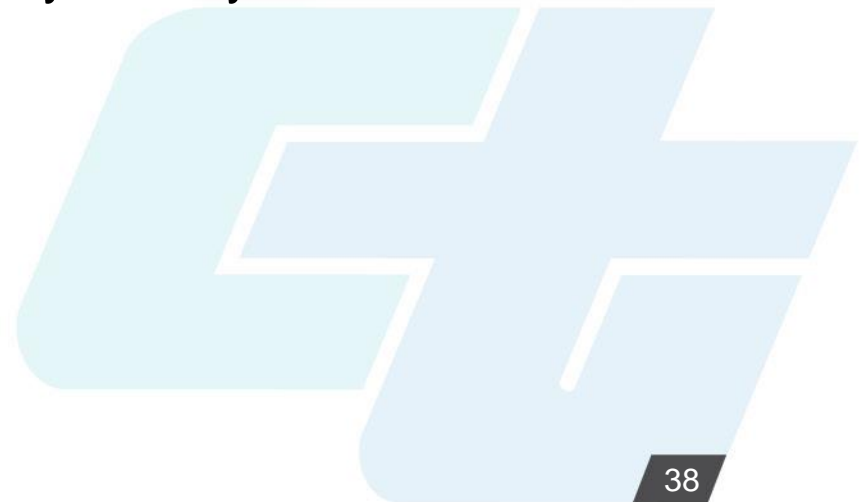
- ▶ Availability and staging of resources
 - ↳ Keep in mind non-transportation resources
- ▶ Operational Strategies, including:
 - ↳ Evaluation of alternate routes and shoulder use
 - ↳ Contraflow Operations
 - ↳ Traffic Signal Operation
 - ↳ Suspension of work zones
 - ↳ Mobilization of contractors and equipment
- ▶ Use of public transportation
- ▶ Traveler information





Emergency Response Planning and Vulnerability Assessment

- ▶ Vulnerable systems or components can compromise effective emergency response
- ▶ Emergency response planning can be a vulnerability mitigation tactic
 - ↳ If critical infrastructure fails, emergency response plans can be implemented in response
 - ↳ Emergency response planning may identify vulnerable components
- ▶ Assessment is key to planning



Vulnerability Assessment

- ▶ Identifies system components that may be weak spots in emergency or disaster situations
 - ↳ Identify, quantify, prioritize (or rank) the vulnerabilities in a system
- ▶ Helps identify critical parts of the system that should be:
 - ↳ Improved (made less vulnerable)
 - ↳ Protected
 - ↳ Monitored





Maintenance of Emergency Operations Plans

- ▶ After event de-briefing
- ▶ Routine maintenance and monitoring
- ▶ Updating emergency plans, contacts resources
- ▶ Training Exercises
- ▶ Human factor – What if?





Equipment

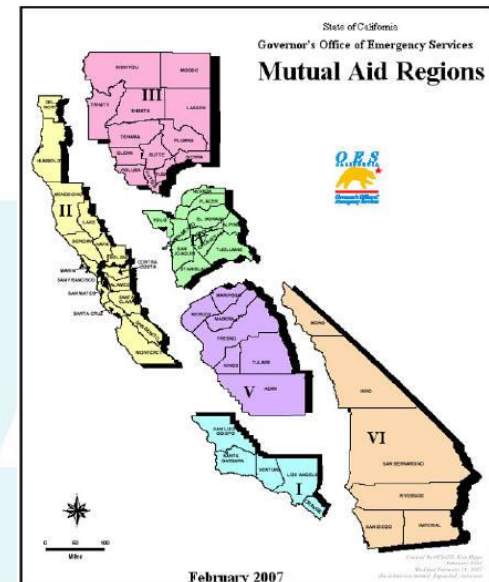
- ▶ Equipment inventory management
 - ↳ List of resources and their location – GPS, Responder
 - ↳ Include TIM, maintenance, ITS resources
- ▶ Traffic control equipment / traffic management systems
 - ↳ TMC
 - ↳ Roadway/weather conditions (e.g. RWIS)
- ▶ Telecommunications and power
- ▶ Hazardous materials management
- ▶ Mapping and information equipment
- ▶ Emergency notification equipment





Mutual Aid

- ▶ Multi-jurisdictional agreements to provide aid across boundaries and borders
 - ↳ Caltrans Districts (D1, D2, D3, D4, D10)
 - ↳ CHP Divisions (Central, Northern, Golden Gate)
 - ↳ Counties
 - ↳ Nevada
- ▶ Participation on tiger teams





Notification, Awareness, and Information Sharing

- ▶ Coordination and notification processes
 - ↳ Multiple means of notification
 - ↳ Media contacts / sharing info with the public
- ▶ Information sharing among response agencies
- ▶ Role of transportation agencies
 - ↳ Maintenance/Operations
 - ↳ Traveler information, public outreach, media relations
 - ↳ QuickMap, 511, CMS, HAR, Internet, Social Media
 - ↳ Emergency Alerts
 - ↳ TV, Radio, print media
 - ↳ Public information specialists





Planned Special Events



► Permanent multi-use venues

- ↳ Sporting events
- ↳ Concerts
- ↳ Festivals
- ↳ Conventions

► Less frequent public events

- ↳ Parades
- ↳ Fireworks displays
- ↳ Bicycle races
- ↳ Motorcycle rallies
- ↳ Seasonal festivals

What are your main special events?



National Special Security Events (NSSE)

- ▶ Designated by the Secretary of the Department of Homeland Security

- Examples:

- ↳ Presidential inaugurations
- ↳ Presidential nominating conventions
- ↳ Major sports events
- ↳ Major international meetings





NSSE Roles and Responsibilities

- ▶ For a local DOT/DPW, involvement can include:
 - ↳ Alternative transportation plan development,
 - ↳ Sidewalk garbage can removal or debris removal
 - ↳ Signal removal, roadway restriping
 - ↳ Detours and multiple street closures, partial or complete highway/freeway closures, ramp or overpass closures
 - ↳ Expedited or closed construction projects.
- ▶ Local agencies and DOTs are often taking direction from a different authority

Benefits of Managing Planned Special Events

- ▶ Promote interagency coordination, resource utilization and sharing
- ▶ Incorporate new procedures, plans, and practices into day-to-day operation of agencies
- ▶ Form partnerships and build trust
- ▶ Reduce traffic congestion
- ▶ Improve mobility
- ▶ Improve travel safety





Discussion

- How do you handle special events?
- What are some lessons learned?
- Cross-talk before permits are issued?





Work Zones





What Are Some Challenges You Experience With Work Zones?

- How do work zones affect operation of the transportation system?**
- Integrated Corridors – is there data sharing between partners?**

Work Zone Challenges

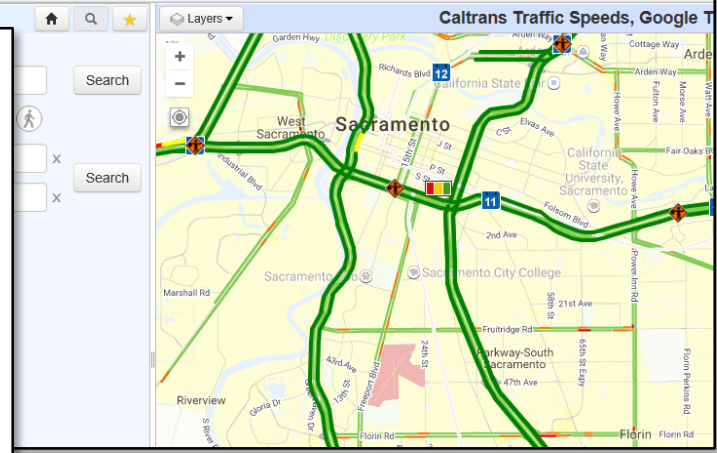
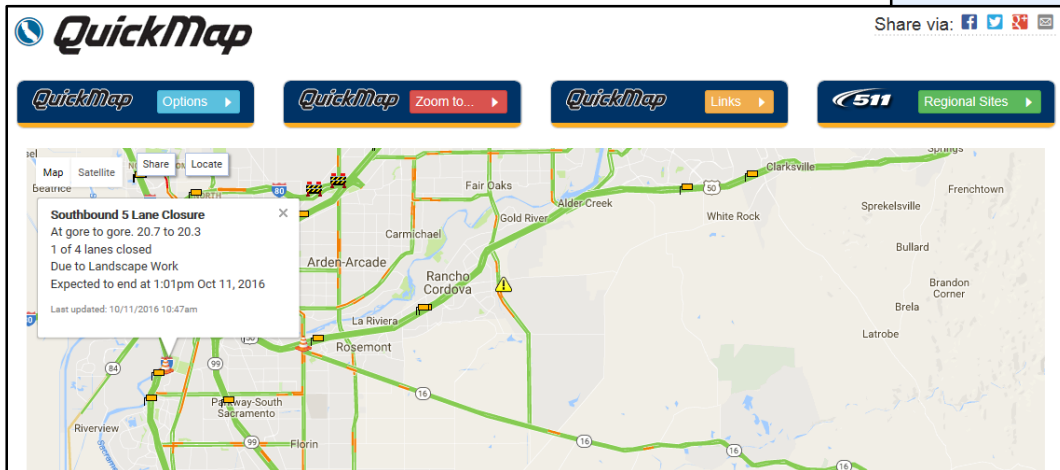
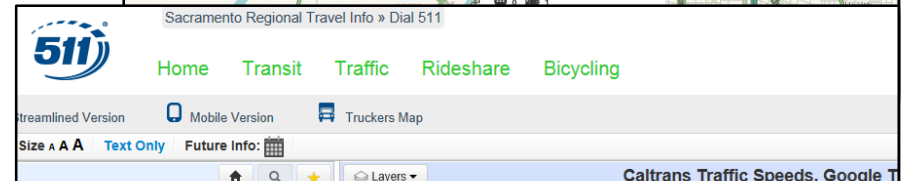
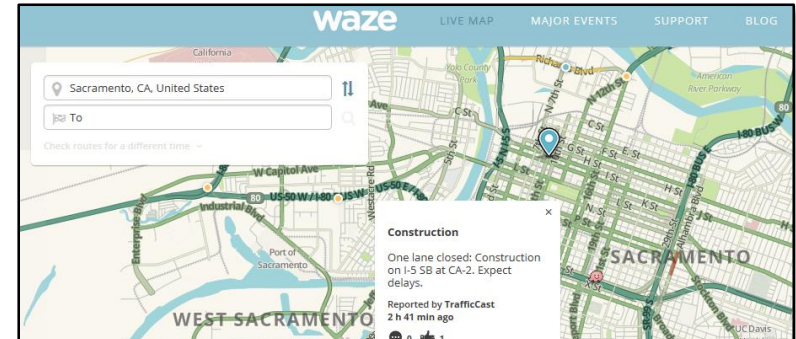
- ▶ Worker & road user safety
- ▶ Work zone congestion & delay
 - ↳ Construction “FSP”
- ▶ Alternate routing & travel route availability
- ▶ Day & night conditions/visibility
- ▶ Traffic pattern changes
- ▶ Incident management
 - ↳ Coordination with responder agencies
- ▶ Freight
- ▶ **ITS Elements – be involved!**



How Travelers Experience Work Zones



23CFR511



Tools: WZ Management Strategies

- ▶ Traffic control
- ▶ Contract incentives
- ▶ Accelerated construction
- ▶ Off-peak/night work
- ▶ Narrowed lanes
- ▶ Ramp closures
- ▶ Contraflow lanes
- ▶ Enhanced enforcement
- ▶ Freeway service patrol
- ▶ Demand management
- ▶ Traveler information
- ▶ ITS
- ▶ Signal timing adjustments
- ▶ ...and many more





TMP Development in Caltrans

Begins during project initiation and planning

- Responsibility of 3 individuals
 - District traffic manager (DTM)
 - TMP manager
 - Construction traffic manager
- 3 levels - factors
 - Project characteristics
 - Projected delay

LEVEL OF TMP	TYPES OF CONDITIONS	TYPES OF STRATEGIES
"Blanket" TMP	<ul style="list-style-type: none"> No expected delays Off-peak work Low volume roads Moving lane closures 	<ul style="list-style-type: none"> Portable changeable message sign (CMS) Freeway service patrol (FSP) Traffic management team (TMT) Only working in off-peak hours
"Minor" TMP (Majority of TMPs fall into this category)	<ul style="list-style-type: none"> Minimal impacts expected Lane closure required for project Some mitigation measures required for project 	<ul style="list-style-type: none"> Only working at night Portable and fixed CMS Construction Zone Enhanced Enforcement Program (COZEEP) or MAZEPP for maintenance activities TMT Highway advisory radio
"Major" TMP (~5% of TMPs are major)	<ul style="list-style-type: none"> Significant impacts expected Multi-jurisdictional in scope Longer duration Multiple contracts involved 	Same as for Minor TMPs plus: <ul style="list-style-type: none"> Public awareness campaigns Extended closures to expedite work Moveable barriers to reverse lanes during peak periods Detours Reduced lane widths Website



Resources





Key Planned Special Events Resources

- ▶ Planned Special Events – Economic Role and Congestion Effects (FHWA-HOP-08-022)
- ▶ Managing Travel for Planned Special Events Handbook (FHWA-HOP-07-108)
- ▶ Planned Special Events: Cost Management and Cost Recovery Primer (FHWA-HOP-09-028)
- ▶ National Special Security Events: Transportation Planning for Planned Special Events (FHWA-HOP-11-012)

Available at

<http://www.ops.fhwa.dot.gov/publications/publications.htm#pse>



Key Work Zone Resources

- ▶ Work Zone Safety and Mobility Final Rule
http://www.ops.fhwa.dot.gov/wz/resources/final_rule/language.htm
- ▶ Developing and Implementing TMPs for Work Zones
http://www.ops.fhwa.dot.gov/wz/resources/publications/trans_mgmt_plans/trans_mgmt_plans.pdf
- ▶ FHWA Work Zone Website
<http://www.ops.fhwa.dot.gov/wz/index.asp>
- ▶ National Work Zone Safety Information Clearinghouse
<http://www.workzonesafety.org>
- ▶ Freeway Management Handbook
- ▶ Work Zone Best Practices Guidebook
<http://www.ops.fhwa.dot.gov/wz/practices/best/bestpractices.htm>



Additional Work Zone Resources

- ▶ FHWA Work Zone ITS Implementation Guide
<http://www.ops.fhwa.dot.gov/publications/fhwahop14008/fhwahop14008.pdf>
- ▶ AASHTO ITS in Work Zones
<http://stsmo.transportation.org/Pages/its.aspx>
- ▶ ITS Safety and Mobility Solutions: Improving Travel Through America's Work Zones
http://www.atssa.com/galleries/default-file/2008July21_ITS_Safety_and_Mobility.pdf
- ▶ Minnesota DOT Intelligent Work Zone Toolbox
<http://www.dot.state.mn.us/trafficeng/workzone/iwz/MN-IWZToolbox.pdf>
- ▶ WSDOT ATM SOP (section F covers ATM in Work Zones)
<http://www.wsdot.wa.gov/NR/rdonlyres/788B7FFC-6BE3-426A-9882-0430180900A6/0/StandardOperatingProceduresdraftv62.pdf>
- ▶ NCHRP Synthesis 379: Selection and Evaluation of Alternative Contracting Methods to Accelerate Project Completion
http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_syn_379.pdf